INFORMATION PROCESSING APPARATUS, JOB

PROCESSING METHOD AND PROGRAM, AND

COMPUTER-READABLE MEMORY MEDIUM

5   BACKGROUND OF THE INVENTION

Field of the Invention

         The invention relates to an information

processing apparatus having transmitting means for

transferring data of a job formed on the basis of

10   application data to a printer via interface means,

job processing method and program, and a computer-

readable memory medium.

Related Background Art

         Hitherto, generally, a dedicated reset signal

15   line is prepared for an interface (parallel I/F, USB,

etc.) for connecting a printer and a computer and a

job which is being printed can be cancelled by

issuing a reset signal.

         After the reset signal is issued, a setting of

20   the printer is returned to an initial value and a

next print job can be normally started.

         However, in such an environment designed on the

assumption that the printer is shared by a network,

there is an environment such that the reset signal

25   cannot be issued. This is because it is intended to

avoid a risk of stopping printing of a third party

possible when a resetting process is indiscriminately

executed.

In such an environment, as disclosed in Japanese Patent Application Laid-Open No. 2001-166892, there has been proposed a method whereby in place of transmitting the reset signal upon cancellation of the print job, whether a data block of the print job has been completed or not is discriminated and if it is not completed, complementary data is formed, the data block is completed, and a process for cancelling the print job is executed.

The complementary data will now be described. The complementary data corresponds to data for shifting the printer to a state where the data transfer of the print job subsequent to the cancellation of predetermined print data can be normally restarted. For example, there is a problem such that when the transfer of the print data to the printer is stopped halfway, if the complementary data is not supplied to the printer, the printer enters a waiting state for reception of a continuation of an incomplete command, the head of the next print data is erroneously regarded as subsequent data, and unnecessary dust printing is executed. There is another problem such that even if the command has been completed, since a form feed code is not received, the next printing is started from a halfway position of paper without delivering the paper.

Therefore, the complementary data prevents such inconvenience. The complementary data is constructed by: data to complete the incomplete command in the print data which remains in the printer and whose

5   stop has been instructed; a command (to reset the setting upon printing) to allow the printer to deliver a page by a paper delivery command of FF (paper delivery) and, further, finish the print job; and the like.

10   However, there is also a printer in which, in the case of sending the reset signal and cancelling the printing, the interface is set to a busy status and the initializing operation is certainly executed.

In this case, there is a problem such that the

15   next print job cannot be printed until the initializing operation is finished.

If two kinds of print system environments of a case where the reset signal can be issued and a case where the reset signal cannot be issued exist, there

20   is also a problem such that it is impossible to execute a desired cancelling process according to the environment. In a printing environment in which a plurality of cancelling methods exist, it is necessary to individually form a print control system

25   corresponding to each of the cancelling methods, so that large development costs are necessary.

As a case where the problems as mentioned above

are particularly presumed, a version environment of
an operating system can be mentioned. For example, in
the operating systems of various versions which are
provided as operation environments of the user such
5 as Windows 2000 (registered trademark), Windows XP,
and the like, there are an OS which supports the
reset signal and an OS which does not support the
reset signal every version of those OSs. Therefore,
in the operating system of a certain version, it is
10 necessary to prepare a software module (which, for
example, corresponds to a data transmission control
program in the embodiment), which uses the reset
signal. In the print system that operates by the
operating system, which does not support the reset
15 signal, there is a problem such that it is necessary
to prepare a software module designed so as to use
the complementary data and large development costs
and a long time are necessary.

Further, although a supporting form such that a
20 printer device of a predetermined apparatus type
corresponds to the operating system of the latest
version is generally used, there is a problem such
that even if the operating system of a new version
corresponds to the reset signal, since the printer
25 device which was sold when the correspondence to the
reset signal was not made has inherently not been
designed to correspond to the reset signal, even if

the reset signal is supported by the operating system by which the print system operates, an error occurs if the reset signal is used in the printer device.

Also with respect to the interfaces, various types of standards exist and whether the reset signal is supported or not is different every type of interface. There is a problem such that even in the case of the type of interface which supports the reset signal, there is also a case where the reset signal cannot be used in dependence on the version of the operating system, and hitherto, it is necessary to prepare a software module to instruct the resetting every combination of the operating system and the type of interface, so that large development costs and a long time are necessary.

Since various cases are presumed as environments in which the print system operates as mentioned above, in such a situation, it is demanded to realize a software module (which, for example, corresponds to the data transmission control program in the embodiment) which can be used irrespective of the difference of the environments and can make a general reset instruction.

Particularly, it is demanded to realize a software module (which, for example, corresponds to the data transmission control program in the embodiment) which can make a general reset

instruction and can be used irrespective of the version of the operating system, the specification of the printer device on its sale, and an arbitrary combination of the types of interfaces as mentioned above.

Further, in the case of the method of executing the cancelling process by sending the complementary data as disclosed in Japanese Patent Application Laid-Open No. 2001-166892, there is a problem such that if the interface enters a busy status due to a no-paper error or the like on the printer side, predetermined complementary data cannot be sent from the information processing apparatus side and the cancelling process cannot be executed.

SUMMARY OF THE INVENTION

The invention is made in consideration of the above problems and, in a print system in which various cancelling methods exist mixedly, it is an object of the invention to provide an information processing apparatus, job processing method and program, and a computer-readable memory medium, in which a cancelling process can be executed by using a proper one of the plurality of cancelling methods in accordance with limitation of various environments in which the print system operates. In an information processing apparatus for transferring data of a job

formed on the basis of application data to a printer
via interface means, there is provided a mechanism
such that a communication environment regarding the
data transfer is discriminated, and when cancellation
5   is instructed during the data transfer, the data
transfer via the interface means is cancelled by one
of a plurality of cancelling methods on the basis of
the communication environment determined by
discriminating means.

10   Or, in an information processing apparatus which
can communicate with a printer, there is provided a
mechanism such that a job including print data based
on application data is formed, data of the formed job
is transmitted to the printer, further, limitation
15   information of cancellation of the job is obtained,
and a cancelling process of the transmitted job is
executed by a cancelling method based on the obtained
limitation information.

20   BRIEF DESCRIPTION OF THE DRAWINGS
Fig. 1 is a block diagram for explaining a
construction of an image processing system showing
the first embodiment of the invention;
Fig. 2 is a diagram for explaining an external
25   storage device shown in Fig. 1;
Fig. 3 is a block diagram for explaining a
construction of a printer shown in Fig. 1;

Fig. 4 is a flowchart showing an example of a first print cancelling processing procedure in an information processing apparatus according to the invention;

5 Fig. 5 is a flowchart showing an example of a second print cancelling processing procedure in the information processing apparatus according to the invention;

Fig. 6 is a flowchart showing an example of a third print cancelling processing procedure in the information processing apparatus according to the invention;

Fig. 7 is an external view showing a construction of the printer to which the invention can be applied;

Fig. 8 is a diagram showing an example of a print setting display screen, which is displayed on a CRT of a host computer shown in Fig. 1;

Fig. 9 is a diagram showing an example of the print setting display screen which is displayed on the CRT of the host computer shown in Fig. 1; and

Fig. 10 is a diagram for explaining a memory map in a memory medium to store various data processing programs that can be read out by the information processing apparatus according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First embodiment)

Fig. 1 is a block diagram for explaining a construction of an image processing system to which an information processing apparatus showing the first embodiment of the invention can be applied. Naturally, the invention can be applied to any of a single apparatus, a system comprising a plurality of apparatuses, and a system which is connected via a network such as LAN (Local Area Network), WAN (Wide Area Network), or the like and executes processes so long as the functions of the invention are executed.

A print control system according to the first embodiment is constructed by a computer 1 and a printer 2. As an external interface, a Centronics parallel interface, a USB interface, an IEEE1394 interface, or the like is considered.

The computer 1 has: an input interface 11; a CPU 12; a ROM 13; a RAM 14; an external storage device 15; an output interface 16; a display unit 17; and a mouse 18. An initial setting program has been stored in the ROM 13.

As shown in Fig. 2, an application program, an OS (a data spooling program, a data transmission processing program, an interface control program, etc.), and a printer driver (a UI display program, a print data forming program, a data transmission control program, an apparatus information database,

etc.) have been stored in the external storage device 15.

The application program is a program for providing a drawing environment and a print environment (the print environment used here denotes a print environment such that which printer is selected via a print dialog of the application, or the like) and instructing the start of printing. The data spooling program is a program for receiving the formed print data, dividing it into print data blocks of an arbitrary size, and repetitively issuing a data transfer request.

The interface control program is a program for writing and reading out data via the Centronics parallel interface, USB interface, IEEE1394 interface, or the like.

The UI display program is a program for displaying a UI for setting a printer driver. The print data forming program is a program for converting figure information drawn in accordance with the application program into a printer command.

The data transmission control program is a program for receiving a data transfer request, transferring the inputted print data blocks, and obtaining status information from the printer and differs from the data transmission processing program described in Fig. 2. The apparatus information

database is a database for storing printer peculiar information.

The RAM 14 has a figure information storing unit 14a, a print data storing unit 14b, and a program loading area 14c. Each program stored in the external storage device 15 is stored in the RAM 14. The CPU 12 controls each unit in accordance with the control program stored in the RAM 14.

Fig. 3 is a block diagram showing a construction of the printer 2 shown in Fig. 1.

In Fig. 3, the printer 2 has an interface unit 201, a RAM 202, a ROM 203, a CPU 204, and an engine 205.

The interface unit 201 is connected to the output interface 16 of the computer 1. The interface unit 201 can be applied to either wireless communication or wire communication. The interface unit 201 can be applied to a form in which a host such as a Centronics interface or the like and the printer are connected in a one-to-one correspondence relational manner or a form in which the host and the printer are connected by the LAN via an Ethernet cable.

The control program and the like have been stored in the ROM 203. The CPU 204 controls each unit of the printer 2 in accordance with the control program stored in the ROM 203.

The RAM 202 is used as a main memory and a work memory of the CPU 204 and has an input buffer for temporarily storing the received data. The engine 205 executes the printing on the basis of the data stored in the RAM 202.

The data transmission control program in Fig. 2 is constructed in a manner such that by obtaining ID information or the like stored in the apparatus information database in Fig. 2, the cancelling method which is supported by the apparatus type can be discriminated.

The printer control system according to the first embodiment further has a construction such that, in addition to the print system comprising the printer 2 and the computer 1 shown in Figs. 1 and 3, the print data from the application is once spooled by intermediate code data as shown in Fig. 4.

An example of the cancelling process of the first print job in the information processing apparatus according to the invention will be described hereinbelow with reference to a flowchart shown in Fig. 4. When the cancelling process in the invention is executed by the host computer, the following operations are consequently executed in the printer: a recording operation of an engine of the printer is stopped; the job data in the input buffer of the printer is abandoned; set values such as

resolution, paper feeding method, print mode, and the like which have been set into the printer upon execution of the job are cleared; an operating mode of the printer is initialized; and the media which is being printed is delivered. In the host computer, the transfer of the spooled print data (job data) to the printer is stopped.

Fig. 4 is a flowchart showing an example of a first print cancelling processing procedure of the print job in the information processing apparatus according to the invention. Fig. 4 corresponds to the procedure which is executed by the data transmission control program (including the functions and processes of the print environment discriminating unit, the interface discriminating unit, and the cancelling method switching unit in the embodiment) of the printer driver which is stored in the RAM 14 shown in Fig. 1. Reference numerals (1) to (8) in Fig. 4 indicate processing steps, respectively.

When cancellation is requested during the data transfer, first, a print environment of the selected printer which can be set by the data transmission control program in Fig. 2 is obtained (1). In other words, the process in step (1) corresponds to a process such that when the data transmission control program issues various settings such as a reset signal (command) and the like to the current selected

printer, the data transmission control program
obtains the information of an operating system which
is presently operating. The data transmission control
program obtains the printer information showing
5   whether each printer stored and managed in apparatus
information database in Fig. 2 supports the
cancellation by the reset signal or not (2). When the
cancellation by the reset signal is not supported, it
means that although the reset signal is supported on
10   the specifications of the interface and the
specifications of the operating system, there is a
case where the cancellation by a cancelling signal is
not supported for convenience on the specifications
of the printer. With respect to the printer of such
15   an apparatus type, information showing that the reset
signal is not supported has been stored in the
apparatus information database in a form such that it
can be referred to. For example, in the case where
the legacy printer which was operating by the
20   operating system which was sold before and does not
support the reset signal is enabled to operate by the
new operating system (print environment) which
supports the reset signal, since the printer has
inherently been manufactured by presuming the
25   operating system which does not support the reset
signal, information showing that the reset signal is
not supported is managed in the printer information.

Although an explanation will be made hereinbelow by
presuming a reset form such as signal which is
transmitted via a physical dedicated line in the
Centronics interface, software reset command which is
5   instructed via a control channel of the USB, or the
like as a reset signal, naturally, the invention is
not limited to such a reset form. Naturally, the
invention can be applied to an information processing
apparatus which can determine the optimum cancelling
10   method from various cancelling methods on the basis
of the limitation information of the cancellation.
The data transmission control program obtains the
type of interface which is presently used for data
transfer (3). For example, in step (3), a printer
15   output port name is obtained by using an API of the
operating system and which type of interface is used
can be discriminated from the obtained printer output
port name. For example, in the case of an IrDA
(InfraRed Data Association) interface or the like,
20   the resetting by the reset signal is not supported. A
method of obtaining the type of interface is not
limited to that described above. Each of the print
environment (OS version) which is obtained in steps
(1) to (3), the printer information which is obtained
25   from the apparatus information database, and the
information of the type of interface or a combination
of some of them is also called limitation information

as information which is used to specify the proper
cancelling method (resetting method). It is true of
the second and third embodiments.

In step (4), the data transmission control
program which functions as an interface
discriminating unit discriminates whether the type of
interface which is presently used for data transfer
indicates the interface which can issue the reset
signal or not. If it is determined that the type of
interface does not indicate the interface which can
issue the reset signal, the cancelling method based
on complementary data is selected in step (8) and the
processing routine is finished.

In step (4), if it is determined that the type
of interface indicates the interface which can issue
the reset signal, whether the printer 2 supports the
reset signal or not is further discriminated from the
obtained printer information in step (5). If it is
determined that the printer 2 does not support the
reset signal, step (8) follows and the cancelling
process based on the complementary data is selected
and the processing routine is finished.

Specific examples in the case where the answer
is NO in step (5) will be mentioned here. For example,
in the printer using the Centronics interface, the
discrimination result of step (4) indicates YES.
However, it seems as if inconvenience of the printer

occurred in the case where the printer receives the
resetting by the reset signal via the Centronics I/F.
With respect to the type of printer as mentioned
above, the information showing that the resetting by
5 the reset signal is not supported has previously been
stored in the apparatus information database in a
form in which it can be referred to.

If it is determined in step (5) that the printer
2 supports the reset signal, in step (6), the data
10 transmission control program which functions as a
cancelling method switching unit discriminates
whether the cancelling method switching unit can
select the data transfer environment or not from the
print environment information obtained in step (1).
15 If it is determined in step (6) that the cancelling
method based on the issuance of the reset signal can
be selected, in step (7), the data transmission
control program as a cancelling method switching unit
selects the cancelling method based on the issuance
20 of the reset signal, activates the reset signal,
cancels the printing process which is being executed
by the printer 2, and finishes the processing routine.

If the data transmission control program
determined in step (6) that the cancelling method
25 based on the issuance of the reset signal cannot be
selected, step (8) follows. The cancelling process
based on the complementary data is executed and the

processing routine is finished. In step (6),
specifically speaking, whether the print environment
(version of the OS) obtained in step (1) can issue
the reset signal or not is discriminated with respect

5   to the interface determined to be YES in the
discrimination result in step (4). For example, even
if the discrimination results in steps (4) and (5) is
YES, when the print environment is Windows NT4
(registered trademark of Microsoft Corporation), the

10 Centronics interface determined that the
discrimination result in step (6) is NO.

When the print environment (version of the OS)
is the latest print environment (version of the OS)
released after the printer was sold or a print

15 environment (type of the OS) other than the above
environments, it is determined that the
discrimination result in step (6) is NO. The
processing routine advances to step (8).

Executing order of the processes in steps (4),

20 (5), and (6) described above is not limited to the
above order. For example, a form as shown in a
flowchart of Fig. 6, which will be explained
hereinlater, is also presumed in Fig. 4.
Discriminating order can be set to arbitrary order so

25 long as the discriminating processes in steps (4),
(5), and (6) are executed. It is true of the second
and third embodiments.

As mentioned above, the computer 1 obtains the type of interface which is presently used for data transfer, the print environment, and the printer information and discriminates whether the cancelling method based on the issuance of the reset signal is possible or not every information. If the cancellation based on the issuance of the reset signal is impossible, the cancelling method switching unit selects the cancelling method for transferring the complementary data. The cancelling process based on the transfer of the complementary data is executed in a data transfer cancellation processing unit. If the cancellation based on the issuance of the reset signal is possible, the cancelling method based on the issuance of the reset signal is selected. The cancelling process based on the issuance of the reset signal is executed in the data transfer cancellation processing unit.

Thus, data transfer cancelling method can be freely switched in accordance with the print environment between the information processing apparatus and the printer and the construction of the printer and the interface without causing a defective printing.

According to the cancellation (resetting of the printer) of the job by the complementary data, the printer has to be able to write information from the

outside. For example, in a status of generation of
no-paper error, the printer enters a busy status and
enters a status where the data from the outside
cannot be written, and the cancellation (resetting of

5   the printer) by the complementary data cannot be
instructed. For example, in the case where data of
three pages has already been stored in a print buffer
of the printer, if the complementary data is written
into the printer from the outside, the cancellation

10   (resetting of the printer) of the job by the
complementary data is executed after completion of a
print outputting process of three pages. There is,
consequently, a problem such that a response speed to
the cancelling instruction is slow. According to the

15   flowchart of Fig. 4, since the resetting by the reset
signal is used as much as possible, inconvenience
which is caused when the complementary data is used
can be prevented. That is, in the resetting by the
reset signal, the certain resetting of a high

20   response speed can be executed.

Since the data transmission control program uses
the optimum cancelling method (resetting method) in
consideration of each limitation information of the
print environment (OS version), the type of interface,

25   and the printer information, a general mechanism of
the cancellation of the job which can properly cope
with many various print environments on the user side

can be realized.

Even if an OS of a new version or an interface of a new type is sold and new items are added to the limitation information, it is possible to cope with it by updating the apparatus information database for making the discrimination based on the limitation information or the print environment discriminating unit and the interface discriminating unit included in the data transmission control program. Therefore, the development costs and time can be fairly reduced.

(Second embodiment)

An example of the second print cancelling process of a print job in the information processing apparatus according to the invention will be described with reference to a flowchart shown in Fig. 5.

Fig. 5 is the flowchart showing an example of a cancellation processing procedure of the second print job in the information processing apparatus according to the invention. Fig. 5 corresponds to the procedure which is executed by the data transmission control program (including the functions and processes of the print environment discriminating unit, the interface discriminating unit, and the cancelling method switching unit in the embodiment) stored in the RAM 14 shown in Fig. 1. Reference numerals (11) to (17) denote processing steps, respectively.

First, in step (11), a complementary data transfer for transferring the complementary data is set as a default of the cancelling method for the printing process.

5   If the cancelling request is made during the data transfer in step (12), the data transmission control program which functions as an interface discriminating unit obtains the current state of the interface in step (13).

10   The data transmission control program discriminates whether the current communicating state of the interface is the error status or the busy status in step (14). If it is determined that the communicating state of the interface is the error

15   status or the busy status, since the complementary data cannot be transferred to the printer 2, the data transmission control program which functions as a cancelling method switching unit discriminates in step (15) whether the cancelling method based on the

20   issuance of the reset signal can be selected from, for example, the print environment information, printer information, and interface information which have previously been obtained in steps (1) to (3) shown in Fig. 4 or not. If it is determined that it

25   can be selected, the data transmission control program selects the cancelling method based on the issuance of the reset signal (16). The processing

routine is finished.

If it is decided in step (14) that the error or the like does not occur or if it is determined that the resetting by the reset signal is impossible, step (17) follows. The cancelling method based on the complementary data is selected and the processing routine is finished.

As mentioned above, the cancelling method can be switched in accordance with the state of the interface.

Thus, the computer 1 in the status where the complementary data cannot be sent to the printer 2 and the cancelling process cannot be executed can execute the cancelling process by switching the cancelling method to the cancelling method based on the reset signal.

The different cancelling methods are freely switched and controlled so as to be adapted to the data communication environment of the computer 1 and the printer 2 which can communicate with each other via the interface. When the cancelling method based on the transfer of the complementary data is set as a default, for example, if an error such as no paper or the like does not occur in the printer, the cancelling process is executed by the transfer of the default complementary data. In the case of an error such as no paper or the like in the printer, if the

printer on the data transfer destination side
corresponds to the cancelling process based on the
reset signal, the process is immediately switched to
the cancelling process based on the reset signal,
5   thereby enabling the cancelling process to be
executed. In this manner, it is possible to flexibly
cope with the foregoing various cases. Consequently,
the apparatus can be shifted to the state where the
subsequent print job can be normally restarted.

10   If the cancellation by the complementary data
can be instructed, it is instructed so as to execute
the cancellation by the complementary data. Therefore,
a problem such that a cleaning process accompanied
with the suction of a head of an ink jet printer is
15   executed by the resetting by the reset signal and the
ink is wastefully consumed can be avoided. The useful
cancelling method can be realized in accordance with
an application field of the user.
(Third embodiment)

20   The case where when the cancelling process based
on the complementary data transfer is supported, the
cancelling process can be executed by the reset
signal has been described in the first and second
embodiments. However, in accordance with a mechanism
25   of the printer, for example, even in the case of
executing a predetermined initializing operation (for
example, cleaning process mentioned in the second

embodiment) like an ink jet printer, by limiting the
timing for issuing the reset signal in accordance
with the executing state of the initializing
operation, the number of times of issuance of the
5   reset signal is minimized and the cancelling process
can be switching-controlled so that the apparatus can
be promptly shifted to the state where the next print
job can be processed. Such an embodiment will be
described hereinbelow.

10   An example of the third cancelling process of
the print job in the information processing apparatus
according to the invention will be described
hereinbelow with reference to a flowchart shown in
Fig. 6.

15   Fig. 6 is the flowchart showing an example of
the third print cancelling processing procedure of a
print job in the information processing apparatus
according to the invention. Fig. 6 corresponds to the
procedure which is executed by the data transmission
20   control program (including the functions and
processes of the print environment discriminating
unit, the interface discriminating unit, and the
cancelling method switching unit in the embodiment)
which is stored in the RAM 14 shown in Fig. 1.
25   Reference numerals (21) to (31) in Fig. 6 indicate
processing steps, respectively.

     First, when the cancellation is requested during

the data transfer, a print environment of the selected printer which can be set by the data transmission control program is obtained (21).

The data transmission control program obtains
5   the printer information showing whether each of the printers which have been stored and managed in the apparatus information database in Fig. 2 supports the cancellation by the reset signal or not (22).

The data transmission control program obtains
10   the type of interface which is presently used for data transfer (23).

In step (24), the data transmission control program functioning as an interface discriminating unit discriminates whether the type of interface
15   which is presently used for data transfer indicates the interface which can issue the reset signal or not. If it is determined that the type of interface does not indicate the interface which can issue the reset signal, step (31) follows. The cancelling process
20   based on the complementary data is selected and the processing routine is finished.

If it is determined in step (24) that the type of interface which is presently used for data transfer indicates the interface which can issue the
25   reset signal, in step (25), the data transmission control program discriminates whether the reset signal can be issued or not on the basis of the print

environment information obtained in step (21). If it is determined that the reset signal cannot be issued, step (31) follows. The cancelling process based on the complementary data is selected and the processing routine is finished.

If it is determined in step (25) that the reset signal can be issued, whether the printer 2 which is communicating supports the reset signal or not is discriminated in step (26) from the printer information obtained in step (22). If it is determined that the reset signal is not supported, step (31) follows. The cancelling process based on the complementary data is selected and the processing routine is finished.

If it is determined in step (26) that the reset signal is supported, the data transmission control program discriminates whether the printer 2 executes the initializing operation (a predetermined pre-print-start process for printing by making a carriage and the like operative) or not in step (27). If it is determined that the initializing operation is not executed, step (30) follows. The cancelling process based on the reset signal is selected and the processing routine is finished. Whether the current target printer executes the initializing operation or not can be specified by referring to the apparatus information database described in the first

embodiment.

If it is determined in step (27) that the initializing operation is executed, step (28) follows and the data transmission control program

5   discriminates whether the initializing operation is executed for a predetermined time or longer or not. If it is determined that the initializing operation is not executed for the predetermined time or longer, step (30) follows. The cancelling process based on

10   the reset signal is selected and the processing routine is finished. Whether the initializing operation needs the predetermined time or longer or not can be also specified by referring to the apparatus information database in a manner similar to

15   step (27).

If it is determined in step (28) that the initializing operation is executed for the predetermined time or longer, the data transmission control program discriminates whether the current

20   communicating state of the interface is in the error status or the busy status in step (29). If it is determined that the communicating state of the interface is in the error status or the busy status, step (30) follows. The cancelling process based on

25   the reset signal is selected and the processing routine is finished.

If it is determined in step (29) that the

communicating state of the interface is not in the
error status or the busy status, step (31) follows.
The cancelling process based on the complementary
data is selected and the processing routine is

5   finished.

As described above, owing to the processes in
steps (21) to (26), when the cancellation is
requested during the data transfer, if the current
print environment is in a state where the reset

10   signal can be issued, the print environment
discriminating unit can recognize it. When the
printer 2 supports the cancellation by the reset
signal, the print environment discriminating unit can
recognize it from the apparatus information database.

15   Owing to the process in step (27), if the
cancellation by the reset signal is supported,
whether the initializing operation is executed or not
can be recognized. In the case of executing the
initializing operation in step (28), an executing

20   time can be also recognized.

Further, the interface discriminating unit can
know the type of interface which is presently used
for data transfer in step (23).

As mentioned above, the cancelling method

25   switching unit obtains the type of interface which is
presently used for data transfer (step (23)). When
discriminating whether the cancelling method based on

the issuance of the reset signal is possible or not,
if the cancellation based on the issuance of the
reset signal is impossible (NO in step (24)), the
cancelling method switching unit selects the

5   cancelling method of transferring the complementary
data and the cancelling process based on the
complementary data transfer is executed in the data
transfer cancellation processing unit (step (31)).

     If the cancellation based on the issuance of the

10   reset signal is possible (YES in step (24)), whether
the cancelling method based on the issuance of the
reset signal is possible or not is discriminated
(step (25)) on the basis of the information showing
whether the reset signal can be issued in the current

15   obtained print environment or not. If the
cancellation based on the issuance of the reset
signal is impossible (NO in step (25)) as a
discrimination result, the cancelling method
switching unit selects the cancelling method of

20   transferring the complementary data and the
cancelling process based on the complementary data
transfer is executed in the data transfer
cancellation processing unit (step (31)).

     If the cancellation based on the issuance of the

25   reset signal is possible as a discrimination result,
whether the printer supports the cancellation by the
reset signal or not is further discriminated on the

basis of the obtained information (step (26)). If the printer does not support the cancellation by the reset signal, the cancelling method switching unit selects the cancelling method of transferring the

5   complementary data and the cancelling process based on the complementary data transfer is executed in the data transfer cancellation processing unit (step (31)).

Whether the printer supports the cancellation by

10   the reset signal or not is discriminated on the basis of the obtained information and if the initializing operation is not executed (NO in step (27)), the cancelling method switching unit selects the cancelling method based on the issuance of the reset

15   signal and the cancelling process based on the issuance of the reset signal is executed in the data transfer cancellation processing unit. In the case of executing the initializing operation, the executing time of the initializing operation is obtained. If

20   the executing time of the initializing operation is shorter than a predetermined time (NO in step (28)), the cancelling method switching unit selects the cancelling method based on the issuance of the reset signal and the cancelling process based on the

25   issuance of the reset signal is executed in the data transfer cancellation processing unit (step (30)).

If it is determined that the executing time of

the initializing operation is longer than the predetermined time, when the obtained current state of the interface (whether the error has occurred or the interface is busy or not, or the like) is the

5 error status or the busy status (YES in step (29)), the cancelling method switching unit selects the cancelling method based on the issuance of the reset signal and the cancelling process based on the issuance of the reset signal is executed in the data

10 transfer cancellation processing unit (step (30)).

If no error occurs and the interface is not busy, the cancelling method switching unit selects the cancelling method of transferring the complementary data and the cancelling process based on the

15 complementary data transfer is executed in the data transfer cancellation processing unit (step (31)).

As mentioned above, even in the printer which executes the initializing operation for a long time by the reset signal, by minimizing the number of

20 times of issuance of the reset signal, the next print job can be normally printed. According to steps (27) to (29), since step (31) is executed after confirming that the inconvenience due to the cancellation of the complementary data as mentioned in the first

25 embodiment does not exist, the cancellation based on the complementary data can be efficiently realized.

Fig. 7 is an external view showing a

construction of the printer to which the invention
can be applied and shows a case of, for example, an
ink jet recording apparatus (IJRA).

In the diagram, reference numeral 5013 denotes a
5   drive motor. A lead screw 5005 is rotated in an
interlocking relational manner with the
forward/reverse rotation of the drive motor 5013 via
driving force transfer gears 5009, 5010, and 5011. A
carriage HC which is come into engagement with a
10   spiral groove 5004 of the lead screw 5005 has a pin
(not shown) and reciprocated in the directions shown
by arrows a and b in the diagram via a guide rail
5003. An ink jet cartridge IJC having an ink jet head
IJH and an ink tank IT is mounted in the carriage HC.

15   Reference numeral 5002 denotes a paper pressing
plate for pressing paper P onto a platen 5000 in the
carriage moving direction. Reference numerals 5007
and 5008 denote photocouplers functioning as home
position detecting means each for confirming the
20   existence of a position of a lever 5006 of the
carriage HC in its arranging area and executing the
switching of the rotating direction of the drive
motor 5013, or the like.

Reference numeral 5016 denotes a supporting
25   member for supporting a cap member 5022 for capping
the whole surface of the ink jet head IJH as a
recording head. Reference numeral 5015 denotes a

sucking unit which functions as sucking means for sucking the cap member 5022 and executes sucking recovery of the ink jet head IJH via an inner opening 5023 of the cap member 5022.

5   Reference numeral 5017 denotes a cleaning blade which is movable in the front/rear directions by a member 5019; 5018 a main body supporting plate for supporting the cleaning blade 5017 and the member 5019; and 5021 a lever for starting the suction of

10   the sucking recovery. The lever 5021 is moved in association with the movement of a cam 5020 which is come into engagement with the carriage HC. A driving force from the drive motor 5013 is transferred by well-known transfer means such as a clutch switching

15   device or the like.

The printer is constructed in a manner such that when the carriage HC reaches an area on the home position side, a desired process of the capping, cleaning, or sucking recovery can be executed in its

20   corresponding position by an action of the lead screw 5005. However, it is sufficient that the printer is constructed so as to execute a desired operation at well-known timing.

Figs. 8 and 9 are diagrams each showing an

25   example of a print setting display screen which is displayed onto the display unit 17 of the computer 1 shown in Fig. 1. A UI display program of the printer

driver shown in Fig. 2 controls the display.

When the user instructs clicking of a property
button B1 in the display on the display screen shown
in Fig. 8, the display screen is switched to a detail
5   setting display screen shown in Fig. 9. A tag TAG1
which can set the cancelling method in the embodiment
is displayed on the display screen and he can select
and instruct a default or automatic switching. By
discriminating the set state, the data transmission
10   control program executes the cancelling method
switching process shown in Figs. 4 to 6 mentioned
above.

A construction of a data processing program
which can be read out by the information processing
15   apparatus according to the invention will be
described hereinbelow with reference to a memory map
shown in Fig. 10.

As described above, according to the first to
third embodiments, the information processing
20   apparatus which can determine the optimum cancelling
method (resetting method) on the basis of each of the
print environment (OS version), the printer
information which is obtained from the apparatus
information database, and the information of the type
25   of interface or a combination of some of them among
the various cancelling methods (resetting methods)
existing mixedly is realized. Therefore, the

cancellation of the job (resetting of the printer)

can be executed by the optimum cancelling method

among the cancelling methods which the printer can

receive.

5   Since the printer driver which can cope with the

printers of the various cancelling methods without

forming the printer driver or the like corresponding

to each cancelling method can be constructed, there

is an advantage such that the developing costs can be

10   reduced. For example, even if a new print environment

(OS version) or a new type of interface is sold, it

is sufficient to update the data transmission control

program (including the functions and processes of the

print environment discriminating unit, the interface

15   discriminating unit, and the cancelling method

switching unit in the embodiment).

    Fig. 10 is a diagram for explaining a memory map

of a memory medium to store various data processing

programs which can be read out by the information

20   processing apparatus according to the invention.

    Although not shown particularly, there is also a

case where information to manage a program group

which is stored in the memory medium, for example,

version information, an implementor, and the like are

25   also stored and information which depends on the OS

or the like on the program reading side, for example,

icons or the like for identifying and displaying the

programs are also stored.

Further, data depending on the various programs is also managed in the directory. There is also a case where a program to install the various programs into a computer and, if the installing program has been compressed, a program for decompressing it and the like are also stored.

The functions shown in Figs. 4 to 6 in the embodiment can be also executed by a host computer in accordance with a program which is installed from the outside. In such a case, the invention is also applied to a case where an information group including the program is supplied to an output apparatus by a memory medium such as CD-ROM, flash memory, FD, or the like or from an external memory medium via a network.

Naturally, the object of the invention is accomplished by a method whereby the memory medium in which program codes of software for realizing the functions of the embodiments mentioned above have been recorded as mentioned above is supplied to a system or an apparatus and a computer (or a CPU or an MPU) of the system or the apparatus reads out the program codes stored in the memory medium and executes them.

In this case, the program codes themselves read out from the memory medium realize the novel

functions of the invention and the memory medium in which the program codes have been stored constructs the invention.

As a memory medium for supplying the program codes, for example, a flexible disk, a hard disk, an optical disk, a magnetooptic disk, a CD-ROM, a CD-R, a magnetic tape, a non-volatile memory card, a ROM, an EEPROM, or the like can be used.

Naturally, the invention incorporates not only a case where a computer executes the read-out program codes, so that the functions of the embodiments mentioned above are realized but also a case where an OS (Operating System) or the like which is operating on the computer executes a part or all of actual processes on the basis of instructions of the program codes and the functions of the embodiments mentioned above are realized by those processes.

Further, naturally, the invention incorporates a case where the program codes read out from the memory medium are written into a memory provided for a function expanding board inserted into a computer or a function expanding unit connected to a computer and, thereafter, a CPU or the like provided for the function expanding board or the function expanding unit executes a part or all of actual processes on the basis of the instructions of the program codes and the functions of the embodiments mentioned above

are realized by those processes.

As described above, according to the invention, the optimum data cancelling method at a point of time can be dynamically switched from the information such as operating environment, interface, state of the interface, selection of the user, and the like.